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The Boston Metropolitan Park Commission.

THE Metropolitan Park Commission, which has lately been organized for the area known as Greater Boston, marks an important step in the progress of the park movement in the great cities of this country. The Commission is one of investigation, appointed by the Governor, to inquire into the needs of the cities and towns in the vicinity of Boston, and to report to the Legislature in 1893 a plan for the provision of ample open spaces in the territory under consideration. The limits of the territory are not defined, and the scope of the investigations in this respect, as in others, is left to the discretion of the commissioners. The establishment of this Commission is an outcome of the organization of the Trustees of Public Reservations, and a direct result of the conference of Park Commissioners and others interested in the subject called by the Trustees last autumn, and held at the office of the Boston Park Commission, an account of which was given in GARDEN AND FOREST (vol. v., page 62). That such a commission has already been authorized is a sufficient indication of the rapid growth of public sentiment in favor of public recreation-grounds. Fortunately, the members of this Commission are admirably qualified for their work. They are all well known, not only as men of broad public spirit, but they have been generously and intelligently active in many worthy projects for establishing and maintaining public parks and for preserving for public use places which have a special value from patriotic association or intrinsic beauty.

It is probable that the scope of the inquiry undertaken by this Commission will be sufficiently broad and thorough to enable the city to deal intelligently with all the important park problems which now confront it. Among the features of the investigation ought to be the reservation of large woodland and hilly areas like the Middlesex Fells and the Blue Hills; of points of marked picturesque, historic or traditional interest like the "Appleton Pulpit," in Saugus, with its neighboring lake-scenery, and the Waverley Oaks in Waltham; of the various lakes or ponds in the metropolitan region; of the margins of the rivers and streams, including the beautiful expanses of salt-marsh bordering their tidal estuaries; of spaces by the sea-shore sufficient to permit water-side recreation; of the reforestation of the islands in Boston harbor; and, finally, a study should be made of the important question of sufficient playground and breathing-spaces throughout all the territory in the suburbs of the city.

A population of something like a million inhabitants is included within the territory which will probably be covered by the investigations of the Commission. There are many passages of strikingly beautiful scenery within this area, but the population is increasing so rapidly that every year sees lamentable encroachments upon some of the most charming landscape passages. There is now an opportunity to deal comprehensively with the subject, and to secure the permanent reservation of precious natural features which many another city with a liberal and far-seeing policy in regard to park matters would have regarded as of priceless value had they existed in its neighborhood. Indeed, Chicago has gone to the trouble of creating, at great cost, landscape-effects which at best are quite inferior to many a scene already existing in the neighborhood of Boston and only need to be preserved.

Fortunately, the public mind is becoming alive to the importance of definite action in the near future, and if the Commission reports a plan covering the ground most thoroughly it looks as if the power of popular sentiment might effect its adoption. Already in a considerable number of the separate communities interested steps have lately been taken looking toward the acquisition and improvement of public grounds, and local park commissions have been appointed. But small communities are apt to deal with such matters solely in relation to their own locality; and they can hardly be expected to treat them as parts of some general system, especially if no such system has been planned. Besides, in places growing as rapidly as the Boston suburbs are growing, there are always matters demanding immediate attention and large outlays, such as sewers and sidewalks to construct, roads to improve, schoolhouses to build, water-works to extend, and these take precedence of works of an "ornamental" character, as parks and playgrounds are too apt to be regarded. Where park improvements have been taken in hand in these places the methods employed and the results achieved have usually presented an unfavorable contrast to the comprehensive way in which the great central municipality has dealt with the subject, both artistically and practically. It therefore seems desirable that the entire metropolitan region should be treated as a unit in the planning of a system of parks and other open spaces.

Altogether, the formation of this Commission seems to us an event of more than local significance. There are many American cities which are expanding as rapidly as Boston is, and which are in immediate need of provision for future parks. The report of this Commission ought to be an important contribution to the literature of the subject, and it will have a special value if it carefully considers the machinery and methods of administering a system of city parks after they are once established.

IN his article, entitled "The Tilden Trust Library: What shall it be?" published in *Scribner's Magazine* for September, Mr. John Bigelow declares that, as regards this question, "the press of New York has a manifest duty, for it is only through the press that the best judgment of her citizens can be evolved, and the public authorities properly encouraged and sustained in giving that judgment fit and adequate support." In the performance of this duty we feel impelled to say that our views differ from those of Mr. Bigelow as regards the proper location for this library.

Mr. Bigelow believes that, if the reservoir on Fifth Avenue can be dispensed with, the library should be erected on the open site which will then embrace the whole area bounded by Fifth and Sixth avenues and by Fortieth and Forty-second streets, and called Bryant Park. The pictures which accompany his article give a pleasing idea of the aspect this square would present with a large library in the centre and four small gardens in the corners, which the cruciform plan of the proposed building would leave vacant. And he is quite right when he says that the situation is so central, and access to it so convenient, that "no site better adapted for a structure of suitable proportions for a metropolitan library could be carved out of any part of the city than this of Bryant Park." But the suitability of the site for a worthy purpose is not the only thing to be considered. We must weigh what we should gain against what we should lose. A single spacious park covering all this site might be of greater advantage to the city than a library and four little parks, and no one needs to be told that playgrounds for children and breathing-places for adults are of the first importance to the well-being of a large city; or that New York, below Fifty-ninth Street, is deplorably poor in such open spaces.

Mr. Bigelow is careful to point out that, if the library is planned according to the pictures he shows, the four gardens for which it will leave room will be larger, in the aggregate, than the space now actually occupied by Bryant Park, as the reservoir now covers a little more than one-half of the area that is called by this name. But four little isolated gardens, each enclosed on two sides by the walls of the library, would be of much less value than a single wide open space almost equal to them in extent. Fresh air, free winds, an open outlook, long vistas beneath umbrageous trees, considerable lawns where the eye can find refreshment, and extended walks where children can play —these are now to be had in Bryant Park; and a visit to it on any pleasant afternoon will prove how thankfully its opportunities are enjoyed by hundreds of poor people from the teeming streets which lie to the westward. Can any one think that their needs would be as well served by four gardens, each about one-fourth the size of this park? Furthermore, it takes a generation for trees to grow to the size now attained by those in Bryant Park. Most of these would perish were the library built, and the present generation of children would be grown up before the corner gardens could assume a shady beauty.

But the question is not between the four proposed gardens and Bryant Park, but between the four gardens and Bryant Park as it might be with the reservoir removed. If this were ever taken down and the vacated area added to the space already open there can be no doubt of its paramount value for park purposes. There is no other space of such a size available between Madison Square and Central Park, and to condemn it to any other purpose would be to deprive New York of its only opportunity to meet a most urgent necessity. The city is not forced to decide between the loss of the library and the loss of the park, but between the loss of the park and the erection of the library somewhere else, which might not be a serious calamity. Bryant Park is a good site geographically now, but twenty years from now it will probably be too far down town. And even if the library were driven to some less attractive and accessible place, the people of the city could endure that with less regret than they would feel for the sacrifice of another considerable fraction of the scanty park area of the city. It has taken years of earnest labor by many public-spirited citizens to organize a public sentiment in favor of the sacredness of every foot of open space on Manhattan Island. There is reason to believe that the people have become determined to allow no disfigurement or curtailment of their parks, and to tolerate no scheme which diverts them from their primary purpose. It is to be hoped that this sentiment is sufficiently strong to defeat such a precedent as would be established by the covering up of Bryant Park with a public building.

The Botanical Garden of Dublin.

AT this time, when there is so much discussion of the establishment of a Botanical Garden in New York City, an account of the Botanical Garden of Dublin may prove of interest. From an article in a recent number of the *Gardeners' Chronicle*, written on the occasion of the tercentenary celebrations of the University of Dublin, it appears that the present Botanical Garden of Trinity College is to be the third of its kind attached to the University. As early as 1710 there seems to have been a Physic Garden which occupied the site of the present library, or, according to some traditions, that portion of the present Fellows' Garden which lies between the library and the Nassau Street boundary. Between 1791 and 1801 several attempts to establish a botanical garden which should be common to the University, the College of Physicians and the Dublin Society proved unsuccessful. But, in the mean time, Dr. Hill, the professor of botany, had rented some ground at Harold's Cross for the purpose of a botanic garden, and he was assisted to some extent by the college. In 1801 a curator was appointed, but it is clear from the college accounts that the plants and houses were to a very large extent, if not altogether, the private property of Dr. Hill, and we also learn from the same source that he was the means of securing for the Dublin garden, through Sir Joseph Banks, many of the plants and seeds brought to England from the South Seas by the members of the exploring expeditions of the time. The article goes on to say:

In July, 1806, the site of the present Botanical Garden at Ball's Bridge was leased by the college for one hundred and seventy-five years at a rent of fifteen guineas per acre. The present garden was commenced in the autumn of 1807, and consisted of about three acres of ground as represented to-day by the botanical portion proper—namely, that situated within the old walls—and the oldest and largest of the trees in this enclosure were mostly planted in the spring of 1808; so that the fine and graceful American Elm, the tallest tree in the garden, the Copper Beech, the characteristic Cedar of Lebanon, and the Italian Stone Pine, the Manna, or flowering Ash, the weeping Elm beside the pond, and other less notable trees have all grown to their present dimensions in a little over eighty years.

In 1832 an addition of about two acres was made adjoining the Blackrock Road, now Pembroke Road, so that the finest of the specimen Hollies, the weeping Beech, Pinus, Platanus, Oak, Arbutus and Garrya here to be seen are only about sixty years old at the most, and show what has proved possible in a town garden in so short a time.

The latest addition to the garden was made in 1848 by the further enclosure of about three acres, or less, which now adjoins the Lansdowne Road, this having been taken in "with a view to admit of a screen being planted parallel to the older north-west wall, and thus afford sufficient protection against smoke, buildings, etc." The last extract from a report prepared by the first curator and designer of the garden, the late James Townsend Mackay, LL.D., illustrates his ability and far-seeing knowledge as a landscape-gardener, for on these two additions, and the exquisite fitness of their fringe of Ilex or evergreen Oaks and Hollies, depends whatever is verdant and beautiful, and sheltered in the garden at the present time.

Mr. John Bain, A. L. S., who was assistant-curator in Mackay's time, afterward succeeded him as curator, and the gardens were much improved under his care. Altogether, Mr. Bain was over forty years employed in the garden. His keenness as a botanist, especially his critical knowledge of native plants, and his remarkable skill as a cultivator, were recognized by the most noted botanists of the time, such as Professor Allman, Dr. William Harvey, Sir W. Hooker, the late Mr. Jas. Veitch, Rev. Wm. Ellis, and Archbishop Whately, who for many years was a constant visitor to the gardens. At this time many then rare plants were grown here with a success perhaps never surpassed. Of such were Vanda cœrulea, the true old Cattleya labiata and C. violacea Harrisoni, Renanthera coccinea, Zygopetalum Mackayi, Mackaya bella (a shrubby Cape Acanthad, founded by Harvey in compliment to Mackay, since called Asystasia by Hooker and Bentham in *Gen. Plan.*), Erica Mackayana, Saxifraga elegans, etc., were also introduced to public notice by Mackay. Here also Mr. W. Ellis and Sir W. Hooker alike saw Ouvirandra fenestralis, Dionæa Muscipula, Cephalotus follicularis, and the North American Sarra-

cenias, in luxuriant health and beauty; and the Cape Disa grandiflora bore flowers as large, and as fine in color, as Harvey had seen them on Table Mountain only a year or two before. Mr. F. W. Moore, now of Glasnevin, also had charge of the gardens, and by his zeal and well-directed industry contributed to their present prosperous condition.

Without undue boasting, it may fairly claim to be, in proportion to its size and general conveniences, a garden as rich in vegetation of all kinds as exists elsewhere in Europe. The main drawback is its proximity to dusty roads and to the smoke of the town. Its best features are excellent shelter—for reasons before expressed, a remarkably deep alluvial soil overlying a gravelly subsoil resting on chalk limestone, abundant moisture, and a climate much to be envied by those of more northern latitudes or farther from the sea.

Many plants, only half-hardy elsewhere, even in the same latitude, here exist perfectly in the open air. Especially noticeable in the garden are the walls which, while giving shelter from the prevailing winds, also serve in the conservation of the rarer of half-hardy shrubs, such as the Loquat, Carob Bean, Mutisia decurrens and the Chilian Colletias; Australian Blue Gums, or Eucalypti; the Japanese Wineberry (Rubus phœnicolasius), "Winter's Bark" (Drimys Winteri) from Magellan, and Wistaria from Japan; Clematis alpina, a sort of shrubby Anemone, from Austria; Veronica Hulkeana from New Zealand and Berberidopsis corollina from high up on the Chilian Andes. Choisya ternata, Smilax latifolia, Zizyphus (Paliurus) spina-Christi, Solanum crispum and Mahonia nepalensis also do well here. Here and there also various interesting rock-plants from the limestone or chalk, the granite from basal Cambrian, or old red sandstone, are here grown in extemporized niches or "pockets" especially prepared for them. You may see the Pyrenean Ramondias so grown, also Edelweiss from the Swiss Alps, and Androsaces, such as A. lanuginosa, from the Himalayas. The last-named plant was first flowered in this garden by Dr. Mackay in 1842. Dianthus, Linarias, Erinus and Iris of many kinds are at home on these wall-tops, and quite recently a special hollow plant-wall has been erected for these and other denizens of the rocky places of the temperate world. A small pond fed by the Dodder River is rich in Aponogeton and Nymphæas, several of Monsieur Latour Marliac's hybrid kinds having passed through the last winter unscathed. The great Gunnera manicata, with leaves five to seven feet across, is here quite at home, as also are the red and green veined forms of G. scabra.

The strong points of the garden are its large herbaceous borders, now gay with many summer flowers. It is also pre-eminently a garden of hardy bulbous flowers of all sorts, Snowdrops, Crocus, Narcissus, Tulips, Iris, Lilies of many kinds; and to see the Crocus or the Narcissi at their best here, late in March or early in April, is a sight not readily to be forgotten.

Overland in the Cayuga Country.—II.

VERY beautiful is the neat and quiet road in this high country beyond Trumansburg. Visitors who now and then come from some western state remark the absence of weeds in the fields and along the road-sides of New York and New England. Yes, weedy road-sides are rare in this Cayuga country. The sides have long since grown soft and smooth under the lapse of time and the occasional plowing and grading. The grass has crept over them in a hard and continuous sod, and the farmers mow them as they do their meadows. Now and then clumps of wild bushes have sprung up at will on the corners or in the hollows, and so long as they do not interfere with the roadway they are not disturbed. Although they may not tell you so and may not even know it themselves, these people have grown to love the copses and wood-lots for their own sakes, for the labor of clearing has long ago been forgotten, and the passion to cut away every green thing has passed away. How well I remember my early days in the woods of Michigan! Cutting and clearing and burning! These were the three merits of the pioneer, and it is little wonder that he came to look upon every bush and tree as a personal enemy. There was no quarter; everything must be swept from the land—every bush on the road-side, every tree in the fields. And long after the farms had been cleared and the roads had become settled and worn this passion remained. But it is gradually burning out, and the next generation will have forgotten it and will look with satisfaction upon the clumps of trees and bushes that here and there spring up in the waste places. The pioneer, and too often the lumber-dealer, have no patience with any talk about forestry—this science must find its chief inspiration in the older states.

One thing more about these roads I must mention in passing: there is no rectangular road system in New York as there is in most of the newer states. It is a blessing that this is so, although there was a time when I looked upon section-lines and quarter-section-lines as the fundamental desideratum in road-building. But I no longer think of a hard-and-fast rectangular road-system with pleasure. The "angling" roads are commonly the most direct communication between neighboring villages, and if they follow the natural trend of the surface as much as possible, they are always beautiful and interesting. Rectangular roads would be the ruin of this fine country, for to toil over hills and ride straight across the hollows and never follow the creeks would be intolerable. Stretching out to the south-west from Trumansburg is an old and well-traveled road which winds along the valleys to Watkins, at the head of Seneca Lake. I have long told my students that a curved drive is attractive largely because it presents new views at every point, but I never caught the full meaning of my own teaching until I drove on this old turnpike. In many places the curves follow each other so rapidly that the traveler is constantly on the alert for new scenes, and these scenes are all the more forcible when they strike one suddenly. But when we came out upon a long straight portion of highway, the feeling was wholly changed. The prospect pleased at first, but it soon grew monotonous, and we fell into conversation.

For ten miles beyond Trumansburg there is little change in the aspect of the country. We still keep within occasional view of Cayuga Lake, and the hills are lower than they were a few miles back. Near Farmer Village we find the first unmistakable evidence of the new life which is brightening the farms of much of this lake region, for here we come upon the Grape. The Grape interest of western New York is very large and is rapidly growing. The census of 1890 showed that the largest vineyard area of native Grapes in America is the New York region, including a strip of Pennsylvania lying along Lake Erie. Some 51,000 acres were found to be devoted to vineyards in this region, and the product sold in 1890 as table grapes was 60,687 tons. The heaviest Grape regions in New York may be said to be four, those lying about Seneca and Keuka Lakes, in Chautauqua County, facing Lake Erie, and along the Hudson. The Seneca Lake district, which is noted for its Catawba vineyards, is now extending itself eastward in this central and northern part of the divide toward Cayuga, and it has even now reached this lake. Most of the Seneca Grape district lies upon the west side of that lake and well toward its southern end, but its eastern branch is now making this broad expansion, the borders of which we have reached at Farmer Village. The particular interest at this brisk hamlet in a horticultural way centres in the Moore's Diamond White Grape, which is here planted more largely than elsewhere. One hundred acres of this variety were set in a solid block in 1891, and this spring fifty additional acres were planted alongside. The hundred-acre plot is now planted to posts, and at a distance it reminds one strongly of old burned tracts in the Pine plains of Michigan, every bleaching-post suggesting the stub of a tree. In all this great tract the ground is kept scrupulously clean. It will be a test vineyard of this new variety of Grape, and it will be watched with eager interest by every grape-grower in the north. There are few White Grapes which can assume to be market varieties, and there is yet much doubt among the more conservative growers whether a white grape will ever find an extensive sale. It is understood, however, that the Diamond is to be a competitor of the Niagara. It certainly has the merit of better quality, but its virtues in the vineyard and on the road are yet largely to be determined. It requires many years to learn the true merit of any Grape, or of any other fruit, for that matter. The value must be largely determined by the uniformity of its behavior during a series of years. And yet nurserymen and others ask the experiment stations for a report upon their fruits the very year following the planting.

Although this is a large vineyard, we shall find much larger ones. This, like most of these very large vineyards set to a single variety, belongs to a stock company. This concern is known as the Boyer Diamond Vineyard Company. Like all large enterprises, it is having a stimulating effect upon the community, and private vineyards are now setting. These new great vineyards are introducing many new problems into the grape business of western New York, particularly as regards hand-labor, which must be reduced to a minimum. The first revolution which it is bound to introduce is in methods of training. The training in common use on Seneca and Keuka lakes is a species of renewal, by which the wood is renewed each year back to the crown on the lowest wire. A cane is trained out in each direction from the head on the lowest wire,

and the shoots are tied to the wires above as they grow. This summer tying is expensive, and the new vineyards are therefore mostly adopting the Kniffen system. This system uses but two wires, while the other uses three, and the canes are trained out on both wires in opposite directions, and the shoots are allowed to hang, thus avoiding summer tying. This system is now the common one on the Hudson, and it is much used in Chautauqua. It has many merits for strong-growing varieties such as Concord, Worden and Niagara, and on the Hudson I have seen even so slender a variety as Delaware doing well trained upon this system. This Boyer vineyard at Farmer Village will be trained upon the Kniffen system, and its behavior will be watched with interest.

Cornell University. *L. H. Bailey.*

Notes on the Flora of Smythe County, Virginia.—IV.

A MONTH and a day later, during the last week in June, we undertook a second trip to White Top. It was midsummer in the Holston valleys, as far as temperature was concerned, and midsummer, too, in the world of vegetation, for flowers were few and nature was resting preparatory to putting on her autumn dress of Golden-rod and Aster, great quantities of which were just beginning to indicate their coming glory of gold and purple. For the first time we had fair weather on the Iron Mountain, and from the gap there were able to see the great sweep of the Alleghanies to the north and north-west. The steep summit of White Top was much more accessible than on our former visit, as the United States Coast Survey had, a few days previous to our arrival, ruthlessly cut long sights in two or three directions through the tall Spruces on the top of the ridge.

Since our first trip the Laurel (Kalmia latifolia) had bloomed and passed away, and the great ravine beyond the Iron Mountain was given over to Hemlocks, Rhododendron maximum and Mitchella repens. The Rhododendron was in bloom, and for miles we were surrounded by that stately shrub. At our feet the little Partridge-berry was at the height of its flowering season, and every inch of ground, even to the banks and cuttings along the road, was decorated with its long trailing vines, laden with the little fragrant flowers and many of the bright red berries of a former season.

In the deep woods, on the White Top slope, three Orchids were blooming. The little Listera convallarioides, a pretty inconspicuous greenish-flowered plant, grew mostly among mosses under coniferous trees, and in the same localities the handsome Habenaria orbiculata towered high above its humble relative. It is a beautiful plant, with two great round shining leaves spreading flat on the ground, and a slender, erect spike nearly two feet high, bearing large green and white flowers. The smallest of the three Purple Fringed Orchids, H. psycodes, was abundant all through the swamp and in the mountain rills, where it grew among the tall Bracken and other ferns. The great banks of Diphylleia cymosa, which had been in full flower a month earlier, were now in fruit, and Trautvetteria palmata, an exceedingly pretty white-flowered plant, bloomed in its stead, filling the woods for some distance on both sides of the road. Both Picea alba and P. nigra, both trees locally called Lash-horns, grew there, and we were told of the existence of two trees of Abies Fraseri, which, however, we were not fortunate enough to find.

The margins of the White Top field are bordered with what appears to be a series of old fruit-orchards. The majority of the trees were Cratægus punctata. The small leaf-buds only had been visible on our first trip; they had flowered in the interim, and the fruit was already half an inch long and very abundant. They were beautiful, crooked, wind-teased old trees, with flat, symmetrically spreading branches. With them were a few trees of C. coccinea, smaller and more shrub-like, though we did see one tree that was a foot in diameter. A few fine old Cherry-trees, Amelanchier Canadensis, two feet in diameter, Pyrus Americana, nearly as large, Quercus rubra, with Beeches and Birches, the two Spruces and an occasional Maple made up the majority of the trees along the summit, where on the topmost crags some very large Menziesia globularis was lingering, and the pretty Vaccinium erythrocarpon was flowering in great profusion. The common Wood Sorrel (Oxalis Acetosella) was there also, and we were very much interested in some of the little plants that had produced pink-purple flowers.

The luxuriant undergrowth of Ferns was in itself worth the journey. Along the edges of the field Dicksonia pilosiuscula had complete possession. Near the moss-hung cliffs there were great banks of Aspidium spinulosum, var. dilatatum, tall, magnificent specimens nearly three feet in height. In the Spruce-swamp and the woods below we found the variety Intermedium of the same species, and growing with it Asplenium thelypteroides, A. Filix-fœmina, Osmunda Claytoniana, O. cinnamomea, the delicate light green Aspidium Noveboracense, A. marginale, and last, though by no means least as to size and beauty, the handsome dark green A. Goldianum. There was scarcely a flower to be seen, but, in their place, banks of feathery Fern-fronds of many shades of green. The finest forest that we saw during our many excursions into the highlands was the one on Pine Mountain, on the border of Grayson County, and the lowest of the three high peaks of the White Top range. If there is such a thing left in south-western Virginia as forest-primeval, it is to be found along Fox Creek, where for several miles we walked through the pathless tract of great trees. It was impossible for us to estimate the dimensions of the trees. The forest offered an apparently endless vista of massive branchless trunks that towered for a hundred feet or more above us into a great canopy of green, and many a prostrate giant proved too great an obstacle for weary feet to climb over.

The Sugar Maple, which is here the variety Nigrum is found in groves, and our young guide told astonishing stories of the large amount of sugar the trees produced. The Red Maple was there also as a large fine tree. The Black Walnuts' superb trunks, unique in size and beauty, were as yet undisturbed by the all-destroying lumberman. Chestnuts were beginning to bloom, and vied with the giant Tulip-trees in the straightness and breadth of their huge trunks. The Chestnut Oak, White Oak and Red Oak were also conspicuous members of the forest. Ashes were laden with fruit, and two Lindens (Tilia Americana and T. heterophylla) were beginning to open their little round flower-buds. T. heterophylla is one of the most showy of the deciduous trees of the mountain forest, its large, very dark green leaves, with the silvery under-surface standing out from the banks of lighter foliage in a particularly conspicuous way. The Beeches were covered with their little triangular nuts, and both Magnolia Fraseri and M. acuminata were also in fruit, the latter growing to a great size.

There was very little undergrowth, and flowers were few. On some of the boulders the great, smooth reddish canes of Rubus Millspaughi (a newly described species, first found in the mountains of West Virginia) grew over twelve feet long and were covered with broad white blossoms. Clethra acuminata was quite abundant in more open situations, and along the edges of the woods Oxydendrum arboreum was showing its white buds. So dense was the shade under the trees that the flaming Rhododendron calendulaceum, long past its flowering season in the open, was still in full bloom and reached nearly fifteen feet in height. Those who were intrepid enough to climb to the top of the mountain told tales of great Spruces over three feet in diameter. The forest is what is locally known as the Douglas tract belonging to some New York gentlemen, and it is to be hoped that it will not share the fate of the forests of the Doe River Gorge, that are being so rapidly exterminated.

One of the rarest of the mountain plants found that day was Boykinia aconitifolia, a pretty white-flowered species belonging to the Saxifrage family, growing on the stony edge of one of the little cold brooks with Thalictrum clavatum. Near it, on some tall cliffs, we found the nearly equally rare Asplenium montanum, not the plant with tiny fronds that grows in clefts of high mountain rocks, but a large beautiful plant with dark green fronds over six inches long, growing in spreading tufts along the crevices of the rocks.

New York. *Anna Murray Vail.*

New or Little-known Plants.

Smilax glauca.

AMONG our common and familiar plants are many which gardeners know little about, and their beauty and value from the garden point of view is not realized. A number of such plants have been figured in this journal from time to time, because we feel that in making them known we are doing a real service to the owners of gardens who, ignorant of the true resources of the American flora, bring less desirable plants than those they could find growing almost at their doors from the four corners of the earth to decorate their estates. Such an unappreciated plant is figured on page 425 of this issue; it is the glaucous-leaved Smilax (Smilax glauca), a common inhabitant of dry sandy uplands from eastern Massachusetts to Florida and Texas. Like nearly all the species of the large

genus to which it belongs, Smilax glauca is an extremely ornamental vine. It is a rampant grower, with long stout stems armed with scattered prickles, large pale leaves, small green flowers, and clusters of handsome black fruit covered with a pale bloom. Less vigorous and less terribly armed than the more northern Bull Bay or Green Bay (Smilax rotundifolia), it grows to a good size in rich soil and is a useful subject for the wild garden, to drape rocks, to help in the protection of boundary plantations, or to use wherever a handsome hardy free-growing vine with tough armed stems is needed.

Fig. 70.—Smilax glauca.—See page 424.

The genus Smilax, as represented in the North American flora, is a considerable one, and many of the species are still very little known or understood, many of them having never been cultivated, although in order to thoroughly comprehend their peculiarities they must be brought together into a garden. Not long ago one of the most ornamental of the North American species was figured in these columns (vol. v., p. 53), and we hope from time to time to bring others to the attention of our readers, that the lovers of hardy plants may learn of their existence and value as ornaments of the garden.

Entomological.

Notes on Two Troublesome Borers.

IF William Cobbett, that enthusiastic Englishman who so ardently praised our common Locust (Robinia Pseudacacia) and advised its general introduction into Britain and Europe a century ago, could have had a few years' experience with the borer which almost renders the successful cultivation of the tree in New England a hopeless task, he would probably have qualified his expressions of admiration and commendation. But the Locust is now a common tree all over Europe, in many parts of which there are trees of fine proportions, and all, apparently, unattended or unaffected in the least by our handsome brown and golden-yellow banded beetle (Cyllene Robiniæ) which does so much mischief as a borer in the early stages of his life. The insect has apparently not yet been introduced into Europe, and there seems to be no reason or probability that it should ever be taken there. The only danger lies in the importation of young infested trees or affected lumber. But, excepting perhaps some peculiar varieties or forms which may be sent out by her nurserymen, or some rare allied species, plants are now never imported, for the species has become almost like a weed in some parts of the Old World.

Besides affecting the common Locust, this borer is also very injurious to the Clammy Locust (R. viscosa), the Rose Acacia (R. hispida), and in the Arboretum it proves a serious foe in the successful cultivation of the newly introduced R. Neo-Mexicana from New Mexico. In fact, it appears more partial to the last species than to either the Clammy Locust or the Rose Acacia.

We are more frequently asked about this pest than almost any other. Like most other borers, this is a very troublesome insect to combat. It is usually more destructive to trees in the open and sunlight than to those growing thickly together in groups or woods. The best, and, in fact, the only suggested remedies are preventive. To give the trunks and larger branches a thick and thorough coat of whitewash, with a large proportion of soap in it, is the best we can do; and where idle children abound it would be an excellent plan to have them daily collect all the showy beetles to be found on the trunks of the trees during the season of ovipositing. It has even been suggested that children might collect the beetles from the flowers of Golden-rod, to which they seem very partial, and they are also to be found on Sunflowers, probably because the colors are protective. It seems to me that this would be less satisfactory than collecting directly from the bark of the trees they infest.

The beetles are very active, and when alarmed or pursued they will run surprisingly fast or will take to flight. It is generally stated in writings that the beetles are to be looked for in early September, but they should be watched for sooner, as many of them emerge in the latter part of August. Without having noticed or looked for them earlier, I found the beetles ovipositing on August 23d, this season. The eggs are quite large, much larger than might generally be imagined, of a dull white color, oblong and soft, and are to be found just under the edges of the roughest bark, or more particularly in places where the bark has been broken and where small limbs have been cut or broken off. Around the openings of their own burrows are also favorite places of the beetles in disposing eggs.

It will thus be seen that in applying any form of wash to the trees to prevent egg-laying it is extremely important to apply it thoroughly and thickly to all the rougher parts, from well up among the branches to very close to the ground. In this latitude it would appear that the wash should be applied as early as from the 20th to 25th of August. We have known the plan of cutting down badly infested trees to be practiced, trusting to suckers to come up and replace them, but when this is done the diseased wood should be burned before midsummer to prevent the escape of the pests within it.

Of course, it will be difficult to keep the pests in check in districts where Locusts abound everywhere unless radical measures are adopted, but where the trees can be easily numbered, as in most New England and northern towns, they could with a little care be kept comparatively free from injuries. It is particularly important to save and protect the trees when young, for the ravages of the borers then sooner cause their death or so weaken the stems that they break in high winds.

A Blackberry-root borer has appeared in the Arboretum in large numbers this season, causing much injury to the various species of this section of the genus Rubus. While it may have been abundant other years it has remained unnoticed, and the death of the canes has been invariably attributed to winter-killing. An examination of the stumps of the dead canes cut off at the ground, this spring, shows a burrow and pupa in almost every one, the empty pupa-case sticking out of holes in the sides of the canes at an inch or two above the ground. The insects from these pupæ are little day-flying moths, known as Ægeria rubi. Both at rest and when flying they have a startling resemblance to our common wasp or "yellow jacket," for which they might very easily be mistaken by the casual observer. The moths were found in considerable numbers on August 23d, some of them just emerged, and appearing more abundantly several days later, and when the Blackberry-bushes were vigorously shaken on a warm afternoon many would arise and flutter around. The eggs are deposited soon after this, near the root of the cane; on hatching the young borers work downward, burrowing in the crown or upper portions of the larger roots; they remain dormant all winter, renewing their activity in spring, and finally boring up the canes a little way or merely to the surface of the crown of the root in preparation for emergence late in August. The full-grown larva is about an inch long, of a light yellowish color, with a brownish head. This insect has been called a Raspberry-root borer, but in the Arboretum I have so far only noticed it as infesting roots of Blackberry, although Raspberry-plants are only a few feet distant. There appears to be no remedy for this pest but digging up and destroying the old roots and replacing them with clean young stock. If the old roots are taken up in the spring or autumn and burned, the whole brood of borers will be destroyed, and new invasions will necessarily have to come from other plantations or wild plants. Those who have been troubled with their Blackberry-canes not bursting into vigorous growth in the spring would do well to examine the crowns of the roots for borers before jumping to the conclusion that the variety of Blackberry was lacking in hardiness to withstand the cold of winter.

Arnold Arboretum. *J. G. Jack.*

Foreign Correspondence.

The Rock-garden at Kew.

ONE of the most interesting and popular of the attractions at Kew is the rockery or rock-garden, a portion of which is shown in the illustration on the next page. It was constructed ten years ago on one of the lawns adjoining the hardy herbaceous plant department, near one of the principal entrances to the gardens. The manner of its construction will be gathered from the following extract from the *Kew Report* for 1882: "As the surface of the site chosen was perfectly flat, it was necessary, in order to get any variation of level, without moving large quantities of soil, that the main path through the rock-garden should be sunk. This path was first laid out in a winding course, so as to bring in as natural features the picturesque trees with which the ground was studded. The general idea which was finally worked upon was that of the rocky course of a stream, such as may be met with in some of the side valleys of the Pyrenees. Such streams dry up after winter, and are bounded by rock-piled banks, amid the crevices of which a copious summer vegetation springs up. Above the rocks an evergreen shrubbery growth descends wherever the soil is of sufficient depth. The path, eight feet wide and 514 feet long at the bottom of the rock-garden, represents the dry bed of such a stream. On either side fragments of rock are piled up in a manner as little artificial as was possible to a height of about five feet. Above this the view is limited by shrubberies of Box, Rhododendron, etc., rising to a varying height."

The natural soil of the site chosen was a perfectly pure sand. As much good soil as possible was therefore thrown in behind the rock-bank. As the stones were arranged good soil was worked in beneath and between them. For parts of the banks with a northern exposure tree-stumps were employed. The use of these has been a good deal criticised, but it is not wholly out of keeping with the general idea, and, as a matter of fact, they prove admirably suited to the growth of the larger and stronger growing species.

The principle of a rock-garden is to imitate the conditions of growth of deep-rooted plants. Almost all sub-

Fig. 71.—The Rock-garden at Kew.—See page 426.

alpines are of this character; the distance to which their roots extend makes them to a great extent independent of extremes of temperature and also of drought. They are all, however, intolerant of standing moisture, and flourish best on sloping broken ground from which water readily flows off and does not rest near the collar of the plant and its dormant winter buds.

The variety of conditions afforded by a garden of this character are necessary for the proper accommodation of a large collection of alpine and sub-alpine plants gathered from all parts of the world. The main difficulty is that of atmospheric conditions, which in a flat, low place like Kew are not always favorable to the growth of alpines. Notwithstanding this, it is surprising how happy many truly alpine plants are in this garden, from the blue Poppy of the Himalayas (Meconopsis) and the imperial Primrose of the mountains of Java, to the Pyrenean Ramondia and the Pinks and Campanulas from the Swiss Alps. Planted in bays left here and there at the foot of the stones are such moisture-loving plants as Trilliums, Arums, Hellebores, and various kinds of bulbous plants, the shade-loving things, such as Meconopsis Wallichii, Ranunculus Lyallii, Myosotedium nobile, Primulas, Ramondia and many Ferns occupying those parts which are protected from the sun's rays by tall Hollies, Pines, Limes, etc. A bog formed of peat, into which water trickles constantly from a jutting rock above, is devoted to a collection of bog-plants, and in another part an imitation old wall is clothed with Cacti and other suitable plants. At the foot of this wall is a peat bed in which hardy Orchids, Equisetums, etc., find congenial conditions.

Surmounting the bank of stones and in front of the belt of shrubs are such stately plants as Liliums, Cistuses, Rheums, Arundos, Single Roses, etc., and on the higher mounds, mixed with the bushes of Box and small Deodars, such striking early summer-flowering plants as Foxgloves, Delphiniums and big Poppies are used with good effect.

Entering at the south end behind some magnificent Hollies, one winds along first through Ferns, then into the sunshine, where the sun-loving plants are, the picture ever-changing, yet never flagging in interest until the end is reached. Of course, such a garden is only possible where careful cultivation and constant attention are available. The strong-growing plants must be kept within bounds, and the needs of the small and delicate properly supplied. Without these a rock-garden would soon become a hopeless tangle of weedy plants, but with them it may be made what it is at Kew, one of the most interesting and delightful of the many departments of horticulture.

London. *W. Watson.*

Cultural Department.

Summer Greenhouse Climbers.

ONE of the best climbers with ornamental foliage is Abutilon vexillarium igneum. It is an excellent plant for rafters, as the branches have a drooping habit, and for the same reason it is admirable in hanging baskets. The leaves are small, compared with those of other members of the genus, but beautifully blotched with light and dark green and pale yellow. The red and yellow flowers, produced in autumn and winter, are also beautiful. It thrives well in a mixture of peat, loam and sand, and should never be subjected to a temperature lower than forty-five degrees.

The Allamandas are admirable summer-flowering plants. A. cathartica is the earliest to bloom, and its comparatively small bell-shaped flowers, of clear yellow color, are produced in profusion. The larger flowers of A. Hendersonii are rich golden yellow, and those of A. Schottii, perhaps the best of all, bright yellow. These plants require ample room, and are most suitable for covering walls and rafters in lofty houses, though they are sometimes grown in pots and trained to trellises with good effect. They like a moderately rich loamy soil, and in the growing season require plenty of water, with less moisture in winter.

Bougainvillea glabra is a desirable climber, extremely showy, and not exacting in its requirements. On the roof of a large house, and not trained too rigidly, it grows freely, and flowers profusely during the summer months. The whitish flowers, however, are insignificant, but the large rose-colored bracts which accompany each small cluster make a charming contrast with the bright green foliage. It should be planted in a rich loamy border, with rest in winter. The temperature may then fall to forty-five degrees, and the plant should be pruned moderately before the growth commences in spring.

Cissus discolor is a fine old plant for pot-culture if the stems are trained to a trellis, though it loses none of its attractiveness on pillars, rafters or walls. It is grown for its richly colored leaves, which are of cordate-lanceolate shape, green of various shades, beautifully mottled with crimson and silvery white on the upper surface, and reddish purple underneath. It requires a stove temperature.

Clerodendron Balfourii is another remarkably handsome stove trellis-plant, blooming profusely in early summer. The dark green leaves are opposite and ovate, and the flowers, produced in large panicles, have a conspicuous, inflated, pure white calyx and brilliant crimson corolla. The young growth should be thoroughly ripened after the flowering period by the free admission of air and light; a maximum temperature of fifty degrees will suffice in winter, when water should be given in only sufficient quantity to preserve the wood from shriveling. Prune in the spring, removing all decayed wood and cutting the previous year's shoots back to two or three joints. The weaker ones require to be most severely dealt with.

Dioscorea illustrata is a plant of the same type of beauty as the well-known Cissus discolor. The cordate leaves are very large, measuring ten inches in length by six in width, of rich deep green color, with parallel veins and a large central blotch of silver-white on the upper side, the lower one being bright purple. The stems die down annually, and the tuberous roots should be stored in a dry cool place, secure from frost, until the following spring, when they may be potted and placed in stove-heat. D. illustrata grows rapidly in rich sandy loam, and has a splendid effect when trained to pillars or columns.

Lapageria rosea is one of the best plants for a cool house—that is, one which is kept as cool as possible by shading and airing in summer, and warm enough in winter to exclude frost. Its ovate-lanceolate leaves are dark green and glossy, and the large waxy flowers deep crimson, with a profusion of small white spots on the interior. Portable specimens may be produced by cultivation in pots, but the plant is more thrifty when grown in a specially prepared border and trained to the roof of the house. The drainage should be perfect and the soil rich and porous. Good fibrous peat and well-decomposed cow-manure, both in pieces not smaller than a good-sized hand, with a liberal admixture of lumpy charcoal and sandstone, form a first-rate compost, which should be firmly pressed about the roots. The young shoots which start from the soil are by far the best, but they have a deadly enemy in snails. The ravages of these pests may be prevented, however, by placing a large rough band of cotton-wool around the base of each shoot, renewing it when it becomes saturated with moisture. Lapagerias dislike strong sunshine, and they should therefore be shaded at all seasons during bright weather. L. rosea alba is a white-flowered variety fully equal to the species in merit, and the two plants make a pleasing combination when grown together.

Plumbago Capensis is very effective on walls, and is a mass of bloom all summer. The flowers are of a charming pale blue shade, produced in large, dense, terminal clusters. The plant should be pruned pretty closely after the flowering period, and kept dry at the roots in winter. It succeeds well in a cool temperature, but abundant light and sunshine are essential to the best development of flowers, and a rich sandy loam is all the roots demand in the way of soil. P. Capensis may also be used to ornament low outdoor walls in summer. The plants for this purpose should be grown in pots, plunged in the soil at the base of the walls to be covered, and wintered in a cool greenhouse or a light airy cellar.

Rhodochiton volubile is exceedingly graceful in habit. It is admirable for rafters, to which the main stems should be trained, allowing the shorter branches to hang downward. These branches are clothed with pale green, cordate leaves, from the axils of which proceed the flowers, borne on long, slender pedicels. The plant is in bloom at all times, and the flowers have a prominent bell-shaped calyx of rosy color, and a dark purple, tubular corolla. The temperature of the house in which it is grown should never be allowed to fall below forty-five degrees, and it should be planted in a mixture of rich loam and leaf-mould, in equal parts, adding sufficient

sand to keep the mass porous. Great care should be exercised in watering, as the plant invariably "goes off" if the soil becomes sour to the smallest extent through excessive moisture, though it may be speedily replaced, as seedlings grow rapidly, and the seeds are freely matured.

Solanum jasminoides is another good cool-house plant. It is a free grower, and makes a singularly elegant covering for columns or rafters. The flowers, borne in large pendent clusters, are bluish white, often pure white, with a showy bunch of yellow stamens in the centre of each. The plant will make satisfactory progress in any ordinary potting soil, but preference should be given to that of a loamy character.

Stephanotis floribunda is an old and deservedly popular occupant of our stoves. The large oval leaves are opposite, leathery in texture, and of deep green color. The tubular flowers, with spreading five-lobed limb, borne profusely in large axillary clusters, are pure white, of waxy substance, and deliciously fragrant. It is an admirable plant for any purpose in which a climbing plant may be utilized, and grows well in any compost, the chief constituent of which is rich loam. When grown in pots—for which purpose it has no rival in beauty—it should be rested in winter and pruned sparingly, removing, however, all superfluous material. After repotting in spring, the old stems and branches should be carefully trained to a trellis, allowing the young shoots, when they appear, to twine around strings attached to the roof of the house. It flowers more freely where this system is followed, and the new branches can be taken down and attached to the trellis, just before the flowers expand, without serious trouble.

Stigmaphyllon ciliatum, the Golden Vine, a somewhat uncommon but very attractive plant, requires an intermediate temperature. It soon covers a large area, its cordate, ciliate, pale green leaves forming a close mass. The large Oncidium-like flowers are of deep golden-yellow color, and freely produced in clusters of fair size. It thrives vigorously in a mixture of loam, peat, leaf-mold and sand.

Tacsonia Van Volxemii is a magnificent plant, with flowers resembling in shape those of the Passion Flower, to which, indeed, it is closely related. They are from four to five inches in diameter, and deep rich crimson. The plant should be trained in the same manner as Rhodochiton volubile, and thrives satisfactorily under the same conditions, adding peat to the compost.

Cambridge, Mass. *M. Barker.*

Roses.

AT this season there is but little to be done among outdoor Roses, except to give the usual attention to cultivation and watering, the latter being of no value unless done thoroughly, while the cultivation is especially necessary during dry weather. As the nights become cooler the Teas will produce better flowers, but it should always be remembered that outdoor flowers, as well as those grown under glass, will be much improved by being cut early in the morning and immediately placed in water. This method improves both the size and color of the flowers, besides making them more durable.

Hybrids for early forcing will now be ripening their growth, and will naturally need less water in order to hurry this process, for it will be remembered that the earliest crops require much more time for their development than those that more nearly approach the natural flowering season.

The most serious pest the Rose-grower of the present day has to contend with appears to be the nematodes, or eel-worms, to which frequent reference has been made during the past year in GARDEN AND FOREST and other horticultural journals. Unfortunately, no specific has thus far been discovered for this pest, the various so-called remedies having all failed under the careful tests of specialists. The most reasonable suggestion that has been offered for their destruction is that of baking or cooking the soil before placing it in the Rose-beds; but this is an operation of considerable magnitude even in a small establishment, and where Roses are largely grown it becomes a very formidable undertaking. It has been suggested that a portable oven of large size and heated by means of steam-pipes would solve the difficulty; but the expense of such an arrangement would work against it in many establishments, especially in those in which the present heating apparatus is not suitable for such purpose.

Lime in various forms has been given thorough tests in several places during the past season and apparently has no effect whatever on the eel-worms, and tobacco extract (which has also been recommended) has not proved any more effectual.

The beautiful Tea-rose Cornelie Koch is more rarely seen since the advent of the Bride, which is a much freer bloomer. During hot weather the Bride is of little value, however, and then Cornelie Koch proves quite useful. In the winter Cornelie Koch, though producing large and fine flowers, is not to be compared with the Bride.

At least one of the new American pedigree Roses has attracted some attention from cut-flower growers, for I recently saw a bench one hundred feet long filled with Golden Gate. The grower seemed well pleased with it, and claimed it to be of about the quality of Safrano. The flowers of Golden Gate are not very large, but are pretty in the bud, and the plant is generally well spoken of as an outdoor bedder.

Another new Rose of much promise, though not of American origin, is Empress Augusta Victoria, a hybrid Tea that was slightly tested last winter, and will have more extended trial during the coming season. In color, this rose is white, and the flowers are shaped somewhat like those of the Bride, the petals having good substance, and in addition to this the blooms are delightfully fragrant. The growth of this variety seems strong and the foliage is of good texture, while much is claimed for its free blooming.

It seems unfortunate that so promising a variety as Waban once appeared to be should have proved so unsatisfactory as it has done. It is possible that all the fault did not lie with the variety, as it is more than probable that over-propagation so enervated the stock as to injure what might otherwise have been a useful variety.

Holmesburg, Pa. *W. H. Taplin.*

Iris Lorteti.

THIS most beautiful Iris, belonging to the Oncocyclus section, was discovered some years ago between Meis and Hounin, in South Lebanon, by Dr. Lortet, the accomplished naturalist of Lyons. It was described by Barbey, *Herborisations au Levant*, p. 178, 1882, who there gives a large colored figure of it. Thanks to the unwearied zeal of Mr. Max Leichtlin, a considerable stock of roots has recently been imported from Palestine.

The Oncocyclus group of Irises is best known through Iris Susiana, which has been in cultivation in western Europe for more than two hundred years, and is still more widely grown than any other member of the group. I. Susiana has its home in western Persia, and stretching away toward the Caucasus lives the next best-known, I. Iberica. This part of the world may, indeed, be regarded as the centre of the group, and as we pass westward along the southern regions of Asia Minor we find several forms, more or less closely allied to I. Susiana, all of them beautiful. Near Mardin grows the lovely I. Gatesii, not far off the striking I. Heylandiana, more to the west, in Cilicia, the handsome I. Saari, and in Palestine is found an Iris which, sent to me from the neighborhood of Nazareth, I exhibited at the Royal Horticultural Society some two or three years ago under the provisional name of I. Saari, var. Nazarena.

Iris Lorteti, in general features, comes very close to I. Saari, and especially, perhaps, to I. Nazarena, but its wonderful coloring puts it by itself as, perhaps, the most beautiful Iris in the world. In the specimens gathered by Lortet, the outer segments are described and figured as showing a very pale blue ground covered with crimson spots, which, scattered sparsely over the marginal parts of the fall, are concentrated into a dark crimson patch or "signal" in the centre beneath the end of the style; the inner segments, or standards, are similarly described as being of a delicate pale rose. In a plant flowered this summer by me, the falls showed a creamy yellow ground marked with crimson spots, concentrated at the centre into a dark crimson signal, while the standards were nearly pure white, marked with very thin violet veins hardly visible at a distance.

I learn that the plants imported by Mr. Max Leichtlin show considerable variation in color; apparently, however, the "note" of the plant is a peculiarly charming combination of crimson spots, and blue or violet veins, on a white or creamy yellow ground.

The flower figured by Barbey is as large as that of an ordinary, or rather smaller I. Susiana. It is perhaps hardly necessary to add that the flower has the characteristic features of its allies; an oval fall convex from side to side as well as reflexed vertically, bearing a loose beard of scattered hairs, an orbicular, erect standard, and a nearly horizontal style lying close on the claw of the fall, and bearing conspicuous semi-circular crests.

Barbey describes the leaves as being very narrow, though his figure somewhat contradicts this, and in the plants grown by me the leaves are very distinctly broader and more ample than in I. Susiana; indeed, it appears to me to promise a larger foliage than is possessed by any other Oncocyclus Iris.

As regards cultivation, I have come to the conclusion that all these Palestine Oncocyclus Irises should be treated in this country by the "taking up" method—at least, until they have become acclimatized, if ever they do. But one or two points appear to be essential for success by this method. In the first place, they should be planted quite late—say in October, or even in November, according to climate; this prevents their making any growth of leaves before winter comes on. In the second place, they must be protected during winter and early spring, so that the young shoots receive no injury from frost. As soon as the foliage, after flowering, begins to lie down, they should be taken up, well ripened in a sunny greenhouse, and kept absolutely dry until it is time to plant them again. The object of this treatment is to secure their not making any very active growth until fairly warm weather sets in, so that when they are hardest at work they may be comforted by genial sunshine, and not buffeted by autumn rains and winter frost as they are when they are left in the ground or planted in early autumn.—M. Foster, in the *Gardeners' Chronicle.*

[The natural conditions of climate in large portions of California are such as are required for the successful growth of this beautiful section of Irises which grow under similar conditions to the Calochorti and Brodiæas. The Oncocyclus Irises would be a gain to the already rich flora of California, and, incidentally, would probably prove profitable plants for export.—Ed.]

Onions at the North Carolina Experiment Station.

IN our Onion tests this year all the varieties grown made a fair crop from the seed, and some varieties, including all the Italian sorts, made a big crop, when the character of the land, a hard-baking red clay, never before cultivated in vegetables, is taken into consideration. In every instance those that were transplanted young made the larger onions. This was true not only of the Italians, but of the Wethersfield Red and Southport Globe, which last, while not growing to an enormous size, made a crop of beautiful onions, and promises, on better soil, to be a fine variety for this climate. All the varieties grown will be exhibited at our state fair, in Raleigh, in October, for the purpose of demonstrating the varieties that can be grown from seeds. We were also pleased with the white Potato Onion. This, of course, must always be grown from sets, as, like the brown Potato Onion, it makes no seed. Our sets were planted in February. They will do better set out here in October or November. This white Potato Onion ought to be a profitable crop for our southern market growers, because of its earliness, and it promises to be a better keeper than the old variety.

On suitable soils I cannot see why the cultivation of the Italian and Spanish Onions, from fall-sown seeds transplanted in February, should not be profitable in the south. Some object to the labor of transplanting, but it is no more irksome than pulling out sets. A shallow furrow is made, the plants are laid along two and a half to three inches apart, with tops all leaning one way, and a little soil drawn over them and pressed tightly with the foot. The thing to avoid is getting them too deep in the ground. This way of planting is more rapid and easy than setting them with a dibble, and they can be put in at a more uniform depth. We propose to plant another crop this fall to show the difference between fall and spring sowing; but there is no doubt that good crops can be grown here by simply sowing the seed in February.

The Mammoth White Pompeii and White Garganus made the largest onions. Queen was earlier and of good size. Barletta matured at about the same season, and the transplanted Barlettas were as large, or larger, than the Queen. I see little difference between Barletta and Marzajola. White and Pink Bermuda made fine crops, particularly the transplanted ones. Giant Rocca is superb and very uniform in size. White Portugal made a fair crop. Wethersfield Large Red was not extra large, but uniform and solid. Southport White Globe is handsome and uniform in size, and, though not so much improved by transplanting as the Italian sorts, is well worth growing in this way. As already remarked, I regard it as very promising for cultivation here, though not so early as some other varieties. The season was later, and the constant deluge of rain kept all varieties growing later than usual, but all ripened well.

Raleigh, N. C. *W. F. Massey.*

Torenia Fournieri is so generally classed as a tender annual that it may be well to note that it is apparently incorrectly rated as such. An abundant crop of plants now in my garden is the produce of self-sown seeds from last year's plants, which indicates that they are properly hardy annuals. The seeds have evidently strong vitality, as they lay dormant in the wet border during the winter and spring, only germinating in July, or, at least, no plants were noticed before that time, and if any appeared they were raked out in loosening the soil.

This is one of the most beautiful and useful of the small annuals, and is too seldom cultivated; at least, it is unfamiliar to others than those accustomed to greenhouse flowers. While it is useful in the greenhouse it is attractive in the borders, and, probably, would long since have been more generally grown out-of-doors if it were understood how easily it is managed. Probably, also, the lack of a common name has militated against it, a taking, easily remembered name seeming to be a necessity if a garden-flower is to be popular, a point well understood by the astute florist. A case in point was recently told me by a seedsman. He one year catalogued a rather novel Ipomœa with picture and description, but it met with no notice and practically no sale. The next year it was catalogued as a Morning Glory with the same picture and description, and the sale of several thousand packets resulted. If we are sometimes disposed to criticise the catalogue makers for their plant names, it may be well to remember that this is not an unmixed evil, as gardens are thereby enriched with plants which, offered only under a scientific name, would attract no notice or sale. Good plants in gardens, though wrongly named, are yet distinct gains.

Tom Thumb Dahlias.—Under this name last year an English florist offered a strain of plants originated with Mr. T. W. Girdlestone, a well-known English amateur. These were offered here this season by Messrs. Peter Henderson & Co. The half-dozen plants in my garden prove to be interesting, though taller than expected, being from eighteen to twenty-four inches high. This, however, is not a disadvantage, as, were the plants more dwarf, the flowers would inevitably be spattered with earth by every rain. The flowers are single and of the usual form and brilliant colors of the taller singles. Growing with these are seedling plants of a French strain which are practically of the same type, equally dwarf, showing that the strain is well fixed.

At present the two lots of plants prove that seedling single Dahlias will progress as fast and come into flower as quickly as rooted cuttings or tubers. Of course, Dahlias are late summer and fall flowers, never doing well until the cool nights come, so that if one has facilities for starting seedlings, say, in April, there does not seem any advantage in planting tubers unless some special color is desired. The flower-stems of the dwarf Dahlias are short, making it necessary to mutilate the plants somewhat in securing flowers with sufficient effective foliage. For a low border they are useful at this season either alone or in front of the taller-growing kinds, as they have abundant foliage and are covered with the most effective and brilliant flowers, in grace perfect foils to the somewhat lumpy but favorite doubles.

Elizabeth, N. J. *G.*

Correspondence.

Some New California Plants.

To the Editor of Garden and Forest:

Sir,—This has been a peculiar season in California, but all bulbous plants have prospered beyond expectation. I have some new native plants of this class which may be worth noting.

Calochortus nudus is a rare form with a small lilac blossom much like that of C. lilacinus. It is found in damp meadows in high altitudes, but with me it thrives in a sandy loam. C. Plummeræ is a new Calochortus of the Mariposa section, and of striking beauty. The large shapely cups grew about two and a half inches across, yellow at the centre and a rich shade of purple without, while the entire inner portion is lined with long fine hairs colored like the petals. It comes from the dry table-lands of southern California. Another distinct Mariposa Tulip is C. macrocarpus, from the Sage-brush deserts of north-eastern California, the other extreme of the state. In beauty of coloring it rivals all others of its class, being a pale violet. The flower is large, the petals not very full, and the habit poor, as the leaves dry up before the bloom appears, and the stalk is stubby and very stiff. I find one trouble in growing these desert forms of Calochortus, and that is a fungus which attacks them when in full leaf and destroys every vestige above ground, and sometimes even descending to the bulb. This fungus comes from their native home and is little inclined to injure other species of Calochortus.

Perhaps the most beautiful Calochortus of the Mariposa section I have had this year is one allied to C. venustus oculatus. In years past I had noticed in some spots remarkably large, finely formed blossoms highly colored and marked differently from the type, but I had attributed this distinction to the sticky clay soil where they were always found. A bed planted with these in the same soil as others continues to show the same attractive characters, and marks it as the choice form among Butterfly Tulips. In this variety the blossom is very large, the outline of the petals full, so that they overlap. The lobe of the petal is creamy, with a band of maroon instead of the maroon eye, and a yellow rim, while the centre shows bright red shadings. The plant is remarkable for its capacity for propagation, as each stalk has from two to four large offsets which become small blooming bulbs the second year. A few bulbs of this would in a few years form a large mass. In a wild state it grows in a sticky wet clay, but it has done as well in the clay loam so well suited to the other varieties of C. venustus.

One of the prettiest of the new varieties I have tried has flowers of a shell-pink tint, and between C. pulchellus and C. albus in form, although when the flower is fully open it shows the stamens and pistil. It is an exquisitely delicate thing, and it thrives well in sandy soil. C. amœnus is its name.

Those who admire Brodiæa laxa will be interested in B. peduncularis, an allied species with the same general habit, pure white flowers, and pedicels elongated, so that an umbel is frequently a foot across. It loves a rich soil and abundant moisture. I found it growing luxuriantly in the gravel in flowing streams and in peat-swamps. As it remains dormant until late, it might do well for spring-planting in the east. Brodiæas, generally, while they will grow in any soil, even the thinnest and poorest, love a rich alluvial soil, and grow luxuriantly in such situations. Wild-blooming bulbs in a single year of cultivation will increase from two to five times in size, blooming proportionally strong. They need good drainage and sunshine, and a shallow soil five or six inches deep is better than a deep soil.

A recent note in GARDEN AND FOREST on Heuchera sanguinea reminds me to say that the most admired plant in my yard is an immense one of H. micrantha. It is in a shaded spot in clay loam, and a solid mass a yard across. The leaves are always beautiful, but in fall they take on very rich coloring. The separate blossoms are inconspicuous, but make a filmy mass most attractive and useful for bouquets. Indeed, I find great pleasure with most of the Saxifrages, and there are few of the family that do not merit a place in the wild garden. In California, outside of the coast, it is hard to keep annuals moist enough to thrive during our hot summers, and comparatively few of the host seen in the eastern gardens find a place with us. But from those things which love heat we can obtain a world of satisfaction—Verbenas luxuriate, Cannas grow like weeds, and all of the composites are in their element.

Ukiah, Cal. *Carl Purdy.*

Spiræa Aruncus.

To the Editor of GARDEN AND FOREST:

Sir,—This herbaceous Spiræa is a tall rank grower and perfectly hardy everywhere. Its creamy white flowers are very small, but they are crowded in such long, many-branched pyramidal panicles that when in bloom this plant compares favorably with the choicest of the florist's perennials. In south-western Missouri, on the southern slope of the Ozark Mountain, it covers the deep and narrow gulches, or gorges, so prevalent here, and seems to prefer a situation of this kind; for while a few specimens are found on gently sloping hills I have never yet seen one growing on level lands. However, when transplanted to the garden or perennial border, they thrive very well, especially if given partial shade. They are admirable in bouquets, where they serve as a foil to large showy flowers, which never appear so well as when combined with soft feathery flowers that suit their outlines and soften their overbrilliant colors.

Several times they have been enthusiastically praised by visitors born and bred in this part of the country who yet did not recognize them in their new surroundings. One lady made a special trip to ask the name of the feathery plant I used in bouquets, utterly ignorant of the fact that she had passed several score of the plants by the road-side as she came to town. It is not unusual for the country people here to be indifferent to the beauty of their native flowers, but their failure to recognize them when growing with cultivated ones shows only too plainly how much the popular taste needs to be cultivated.

Pineville, Mo. *Lora S. La Mance.*

Recent Publications.

Trees of the Northern United States. By Austin C. Apgar. American Book Company, New York.

Perhaps one-half of our adult male population would be able to distinguish an Oak from a Maple; but those who can tell the difference between a Sugar Maple and a Norway Maple, or between a Spruce and a Fir, not to speak of their ability to identify the different species of Spruces or Firs, constitute a small fraction even of our intelligent people. This would be surprising if their knowledge of other objects which they cannot help seeing and hearing every day was more exact—if the more common birds could be recognized by their notes, or if a "bug" or a "worm" were not about the most definite and specific names they would be able to apply to any individual of the teeming millions of insect-life about them. No doubt, the prevalent system of education is responsible to a certain extent for this general lack of the observing habit—a habit which is an original part of the mental equipment of every child; and if school-training has in any way helped to suppress this inquisitive tendency, those educators are engaged in a worthy work who are trying to introduce into schools a kind of study which goes directly to natural objects rather than to books which treat of these objects. This little volume is an attempt to direct both teachers and pupils in the study of the trees, both wild and cultivated, which are found east of the Rocky Mountains and north of the southern boundary of Virginia and Missouri, and it embraces so large a proportion of the trees which grow south of that line that it will be found a good text-book for the schools of the southern states.

The aim of the book is primarily to promote the study of natural science in the natural way; and trees are selected as its special subject, because they are always and everywhere present, and have a certain interest for everybody. In the ordinary text-books of descriptive botany the parts primarily examined are the flowers and their organs, but as these are generally fugacious, inconspicuous and often inaccessible, in this book the attention is directed to the parts which can be found throughout the greater part of the year, and the parts, really, which every one must become acquainted with who learns even to recognize the different trees. The leaves particularly, the wood, the bark, and, to some extent, the fruit are the characters chiefly noted. There is an artificial key which is very ingenious and which will help the beginner in his identifications; there is a glossary of such descriptive words as are needed, and brief descriptions of the species in their botanical order, with good outline figures of the leaves of every one. In a condensed manual of this sort no two persons would include exactly the same material. We should have preferred, for example, to see more than one species of Tamarisk named, and we feel that the foreign Lindens have not been fairly treated. But the book has been prepared with care and sound judgment, and is plainly written out of the personal observation of the author.

Its prime merit, however, is not in the information it gives about trees, but in the skillful way in which it directs the inquirer to study the trees themselves. The chapter on leaves is truly said to "be devoted mainly to the words needed for leaf-description," and the aim throughout is to teach the learner "to employ his own senses in the investigation of natural objects, and to use his own powers of language in their description." So far as any one does this he is working in the line of genuine scientific research. We cannot all become accomplished scientists in any line, but it is possible for every one to become interested in and acquainted with the trees of his neighborhood, and Professor Apgar's book is the best help available to any young person who wishes to begin this useful and fascinating study.

Notes.

The vintage will be smaller in California this year than it has been for five years past.

Among Palms in commerce Areca lutescens seems the most popular in this country, and sells the most readily.

Mr. C. D. Ball, well known as a grower of Palms, in reply to the question whether he had experienced of late much trouble on account of the failure of Palm-seed to germinate, answered in a late number of *The American Florist* that he had. The demand for Palm-seed is so great that it is not easy for

collectors to meet it, and consequently old seed is often worked in with the new.

The famous Black Hamburg Vine at Speddoch carries more than 500 clusters of grapes this year, and some of the larger ones will weigh four or five pounds. Last year more than a thousand pounds of fruit were cut from this vine, and the crop this year will reach at least 1,200 pounds. The girth of the vine, which was originally a cutting from the Hampton Court Vine and set in the early part of the century, is now two feet and four inches.

It is stated in *Meehans' Monthly* that if Kieffer Pears are gathered a little before they are mature and then ripened slowly in a room that is cool and not too dry they will rank as table fruit of the first quality. No doubt, rapid ripening impairs the flavor of some pears, but persons who are familiar with the Kieffer as it is found in the market, will find it hard to believe that any skill can transform it into a dessert pear of unexcelled quality. Its value for canning is generally acknowledged.

Just now the Spice-bush is very attractive, as its bright red fruit shows through the rich green foliage. Indeed, it is beautiful the whole season through. It is among the very earliest of native shrubs to bloom; its leaves are of a fresh color, and free from diseases or insect attacks, and its fruit gives it a new value in autumn. An occasional cutting back will overcome its tendency toward a habit too open, but on the borders of woods or shrubberies it needs no attention, and is always satisfactory.

In the early part of this century extravagant expectations were raised over the possible advantages of soil analysis, and when these high hopes were found delusive a prejudice was excited against all such analysis, which is not yet outgrown. It is pleasant, therefore, to note that some scientists remember that the study of soils may have a practical bearing on agriculture, and Professor E. W. Hilgard's report on the Relations of Soil to Climate, lately published by the Department of Agriculture, will be welcomed as a timely contribution to the subject.

The last bulletin of the New York Experiment Station repeats that there is no question as to the efficacy of the Bordeaux mixture as a preventive of the leaf-blight which has been so destructive to Strawberries in many parts of the country this year. The young plants should be sprayed the first year as soon as they become established, and the mixture should be applied four times during the first season, and at least twice before fruiting the second season. The mixture is now prepared with only half the strength originally used, the formula being two pounds of lime and three pounds of copper sulphate with twenty-two gallons of water.

Urceocharis Clibrani is the name given by Dr. Masters to a hybrid between Urceolina pendula and Eucharis grandiflora, and originated by Messrs. Clibran, of Oldfield Nurseries, Altrincham, England. Judging from a figure in the *Gardeners' Chronicle* the flowers are curiously intermediate in form between the two parents, and they are very beautiful and interesting. The flowers are borne on ascending stalks as in Eucharis, not pendulous as in Urceolina. They are pure white, borne in umbels, each one two and a half inches long with a slender tube expanding into a cup-shaped limb. The new hybrid promises to be of great decorative value.

A Belgian horticultural journal, regretting the fact that almost the only creepers used for the ornamentation of houses in Belgium are the Grape-vine, the Ivy and the Honeysuckle, recommends four others as especially desirable. These are the Silk-vine (Periploca Græca) of southern Europe and the Orient, a twining shrub of the order Asclepeiadeæ; the Chinese Calystegia pubescens, which belongs to the Convolvulaceæ, and is callen Bearbind in England, and two of our familiar American creepers, the Dutchman's Pipe (Aristolochia Sipho) and the pretty Groundnut (Apios tuberosa), which we seldom cultivate, but constantly see growing wild along our woodland fences, with its purplish clusters of vanilla-scented flowers, doubly welcome as they appear late in the summer.

Not many weeks ago the bridge joining Castle Island to the mainland of Marine Park at City Point, in Boston, was completed, and the island was thrown open as a public pleasure-ground. It is twenty-one acres in extent, and, says the Boston *Herald*, on the first Sunday after it was opened it was invaded by many thousands of visitors, who filled it full in every nook and corner. Nothing has as yet been done to give it a park-like aspect, except to burn off its great crops of weeds, leaving the ground for the moment black and bare. Plans for its adornment are not yet complete, but a drive-way will be carried from the bridge along the shore to a "concourse," which will be built out into the water; a shelter will be built on the point now occupied by the hospital; other desirable buildings will be constructed, and trees in due number will be planted.

According to the San Francisco *Chronicle*, a gourd from Japan is proving valuable for all purposes where a sponge is used. This Luffa grows on vines twenty or thirty feet long, and while young it is edible, and when cut up in slices like Okra it is highly prized as a flavoring constituent in soups. When fully grown the interior of the gourd becomes a fibrous spongy mass, and this is separated from the shell and outer flesh by boiling in water to which a large quantity of soda or soap has been added. After being thus treated the resultant fibre is dried, and then takes on a sponge-like appearance. It has been tested in the bath, in the household and in the stable. The hottest water does not injure it. It is very flexible and soft, and it is durable as well. The correspondent who has been making the tests is very enthusiastic over the results, and believes a beginning has been made in what will become a very important industry.

The last number of the *Gardeners' Magazine* contains illustrations of two of the hybrid Sweet-briers which have been obtained by Lord Penzance, one of them, Lucy Bartram, showing finely shaped flowers of an intense crimson, and the other, Alice Bridgworth, being a pleasing shade of rose, while the base of the finely shaped petals is white. The Eglantine has been used both as the seed parent and the pollen parent. When hybrid perpetual Roses are fertilized by the Sweet-brier, the leaves of the resulting hybrid do not have the fragrance of the pollen parent, but in many of the reverse crosses the delicious fragrance of the foliage is retained. Most of the crosses have single flowers, although some of them have two rows of petals. In some cases they have proved perpetual bloomers, and give a fine show of flowers in autumn. Lord Penzance is experimenting with hybrids containing Tea blood, and making crosses of many other kinds, and the results obtained will be looked for with interest by all who love the queen of flowers.

Nicotine, the alkaloid which gives its special qualities to the Tobacco-plant, says Monsieur Jules Rochard, of the French Academy of Medicine, writing recently in the *Revue des Deux Mondes*, was discovered by Poseelt and Remann, and first isolated by Vauquelin in the year 1809. "It is an oleaginous liquid, colorless and transparent, which grows dark and thick when exposed to the air. Its sharp, acrid odor is like that of tobacco; it is burning to the taste, and its vapor is so irritating that breathing is a painful act in a room where even one drop of it has fallen. . . . The different kinds of Tobacco contain it in varying quantities. The black, oily tobacco of the Antilles contains much more of it than the light-colored fragrant tobacco of Levantine countries. Its quantity increases with the development of the plant, and varies according to the tissues of its leaves, thin-leaved plants containing it in smaller amounts than thick-leaved ones. The fermenting process through which tobacco is passed volatilizes the nicotine in part, and thus there is less nicotine in tobacco when it is ready for consumption than there was in the dried but unprepared leaves."

The beautiful model of a typical French farm, which attracted great attention at the Paris Exhibition of 1889, will probably be surpassed next year at Chicago by a "model Washington farm in miniature," which Mr. William L. La Follette, Superintendent of the Agricultural Department in the exhibition of the state of Washington, intends to have prepared. This little reproduction will include "farm-houses, barns, fences and fields of growing grain. There will be fields of summer fallow with tiny gang-plows in the furrows, and threshers, binders and all other farm-machinery will be shown in miniature just as they appear while in use in the far west." Mr. La Follette also proposes to erect a "a large cold-storage safe with glass sides and neatly arranged shelving," in which all the fresh fruits of Washington will be displayed during their seasons. "The collectors in the state will keep a constant supply going to Chicago by fast express. First the safe will be filled with luscious strawberries, and from that on during the succeeding seasons as the fruits ripen the cold-storage display will include all varieties ripening from May 1st to October 30th. This manner of exhibiting fruits," we are told, "will excel anything that can be procured in the way of preserved specimens, although the Commission will have an ample display of all kinds of fruits preserved by the most approved methods."